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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,275	03/01/2002	Ryoichi Takayama	MAT-8235US	3087

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EXAMINER

SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 06/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/087,275

Applicant(s)

Takayama et al.

Examiner

Bailara Summors

Group Art Unit

2817

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 (three) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☐ Responsive to communication(s) filed on _____
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-13 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-13 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☒ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892 (2 pages)
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 2, the sentence on lines 9-12 appears to be directly opposite of that on lines 22-24 which is also the recited invention (see claim 1, the last three lines thereof). Perhaps there has been some problems with translation from Japanese to English? Note also the § 112 rejections below. On page 15, line 11, note that "filters" should be --resonator--. On page 15, lines 13 and 14, it appears that one of the occurrences of "Li" should be --La-- which has not been defined such that the relation can be understood. On page 16, the sentence on lines 5-9 is totally incomprehensible. The Examiner can not determine which resonators have a larger or smaller capacitance either before or after division. On page 16, lines 24-26, it appears that "Li" and "La" are both being defined as the same thing, that is "Li is the intersecting width...of the divided resonator" and "La is the intersecting width...after the division". Clarification is required. On page 16, there appears to be some missing text between lines 26 and 27, or is a comma misplaced? These lines are not understandable and clarification is required. On page 18, lines 1-2, this statement appears to be the exact opposite of the invention (see e.g. claim 1, the last three lines thereof).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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3. Claims 1-13 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification is contradictory as to whether the transmission filter "has a larger power durability at the antenna terminal 6 than the input terminal 1" (see e.g. the spec. at pg. 18, lns. 1-2 and pg. 2, lns. 9-12) or "has a power durability at the input terminal, being equal to or larger than a power durability at the antenna terminal" (see e.g. the spec. at pg. 2, lns. 22-24, and claim 1, the last three lines thereof). Therefore, one of skill in the art has not been enabled by the specification to make and/or use the invention because it is unclear from the contradictory specification what are the exact power durability requirements of the inventive filter. See also the attached abstract of the corresponding Japanese application JP 2001-285025 (the last four lines) which is also contradictory of the claimed invention of the instant application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor

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and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishihara et al. U.S. 5,909,156 taken in conjunction with Applicants' admitted prior art Fig. 29.

Applicants' admitted prior art Fig. 29 discloses the well known arrangement of an antenna duplexer with an input terminal 301; a transmission filter 302; a phase shifter 303; a reception filter 304; an output terminal 305; and an antenna terminal 306 all arranged and connected as recited. However, Fig. 29 does not show a transmission filter being a surface acoustic wave (SAW) filter with the recited power durability.

Fig. 3 of Nishihara et al. discloses a SAW ladder filter for use as a transmission filter of an antenna duplexer (see col. 8, lns. 8-9 and col. 1, lns. 9-15) comprising: a circuit that is identical as seen from both ports thereof (see col. 8, lns. 15-25 for the specific structures of the P-S-P'-S-P resonators); a substrate; and the resonators and conductor patterns disposed on the substrate in a symmetrical arrangement. Because the SAW filter circuit is symmetrical (i.e. P=P, S=S and P' in the middle), the filter must inherently have equal power durability at each of its input port and output/antenna port, and the SAW filter was especially designed for high power durability (see e.g. the abstract, the last three lines thereof). However, Nishihara does not specifically show a duplexer with a phase shifter connected thereto as recited.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW filter of Nishihara (Fig. 3) by having used it as the transmission

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filter in a duplexer with a phase shifter such as taught, for example, by Applicants' admitted prior art Fig. 29 because Nishihara explicitly suggested the use of its SAW transmission filter in a duplexer (see col. 1, lns. 9-15). It would have been equally obvious to one of ordinary skill in the art at the time the invention was made to have modified Applicants' admitted prior art Fig. 29 by having substituted the SAW transmission filter of Nishihara (Fig. 3, col. 8, lns. 8-25) in place of the generic transmission filter 302 of Applicants' admitted prior art Fig. 29, because such an obvious modification would have provided the advantageous benefit of increased power durability in a duplexer filter as suggested by Nishihara (see e.g. the abstract and col. 1, lns. 26-30).

Allowable Subject Matter

6. Due to the § 112, first paragraph issues, any patentability determinations are being deferred by the Examiner. However, if claim 4 is correct in reciting that the "first resonator includes a plurality of second series arm SAW resonators" (lns. 5-6) and is "disposed at an outermost arm towards said antenna terminal" (emphasis added)[lns. 2-3], then this would appear to be allowable subject matter. The prior art of record only shows multiple series arm SAW resonators at an arm closest to an input terminal of the SAW filter which, in the case of a transmission filter, would be the side away from the antenna.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ito JP 2001-156588 discloses increasing power durability of a SAW filter by having a group 11 (Fig. 1) of resonators in a series arm nearest the input of a SAW ladder filter.

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Noguchi JP 10-256869 discloses (Figs. 6 and 7) a transmitting SAW ladder filter that is symmetrically laid out on the piezoelectric substrate, and wherein the filter has equal power durability at its input and output terminals due to its symmetry and the power dissipating lines 32 and 36 (see the abstract, lns. 1-2 and the last five lines thereof).

Shimamura et al. JP 11-251871 and U.S. 6,208,223 (Figs. 4, 5, and 6) and Taniguchi et al. JP 9-205343 (Figs. 4, 6, 7, and 9) each disclose increasing power durability of a SAW filter by having plural series connected resonators in a parallel arm nearest the input of a SAW ladder filter.

Tagami et al. JP 10-22767 discloses a duplexer having a SAW transmitting filter with increased power durability (see Fig. 1 and the abstract).

Nishihara et al. U.S. 5,955,933 discloses increasing the power durability of a SAW ladder filter by using multiple bond wires to the input stage series and parallel arm resonators (Fig. 4).

Nishihara et al. JP 10-303698 (see Fig. 1 and the abstract, lns. 12-18) and Miyashita et al. (Figs. 1 and 13 and the abstract) each disclose a SAW ladder filter with greater power durability at its input.

UU JP 9-116380 discloses forming a high power resistance ladder filter with a combination of parallel arm SAW resonators and series arm LC resonators (Fig. 1).

Taguchi et al. EP 0 663 721 discloses (Figs. 3 and 5) arranging a SAW ladder filter to have a serial arm or a parallel arm nearest the input/output depending upon whether the filter is a transmitting or receiving filter.

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Takayama et al. U.S. 5,844,347 discloses increasing the power durability of a SAW ladder filter [Figs. 1(a) and 1(b)] by providing multilayer electrode materials.

Yuda et al. EP 1 030 448 discloses the known arrangement of a phase shifter before the receive filter of a duplexer (Fig. 7) in the same manner as Applicants' admitted prior art Fig. 29, and also discloses increasing the power durability of a receiving SAW ladder filter (see section [0043]) by providing plural series connected resonators in the series and parallel arms nearest the input (see sections [0022] and [0023]).

Kondo et al. JP 6-350307 also discloses the same phase shifter/duplexer arrangement as Applicants' admitted prior art Fig. 29.

Hickernell U.S. 5,949,306 discloses providing plural SAW resonators in series and parallel arms of a SAW ladder filter (Fig. 9), but does not discuss the power durability of the filter.

8. Any inquiry concerning this communication should be directed to Barbara Summons at telephone number (703) 308-4947, FAX no. (703) 308-7724, receptionist's no. (703) 308-0956, Supervisory Examiner Bob Pascal (703) 308-4909.



Barbara Summons
Primary Examiner
Art Unit 2817

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June 8, 2003
(1 attachment)

Attachment 1
WEST

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L3: Entry 12 of 319

File: JPAB

Oct 12, 2001

PUB-NO: JP02001285025A
DOCUMENT-IDENTIFIER: JP 2001285025 A
TITLE: ANTENNA COMMON-USE UNIT

PUBN-DATE: October 12, 2001

INVENTOR-INFORMATION:

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APPL-NO: JP2000100295

APPL-DATE: April 3, 2000

INT-CL (IPC): H03 H 2/72; H01 P 1/213; H03 H 2/145; H03 H 2/25; H04 B
1/50

ABSTRACT:

PROBLEM TO BE SOLVED: To provide an antenna common-use unit which has stable electric power resistance, even with respect to the input of a signal from an antenna terminal side and also has stable characteristics.

SOLUTION: This unit is equipped with a transmission-side filter which has its input side connected to an input terminal, a phase shift circuit connected to this transmission-side filter, a reception-side filter connected to the phase shift circuit, an output terminal connected to the reception-side filter, and the antenna terminal connected between the transmission-side filter and phase shifting circuit, and the transmission-side filter is a ladder type surface acoustic wave filter. The outermost arm on the antenna terminal side is a series arm SAW resonator 45b and the transmission-side filter is characterized in that the electric power tolerance to a reflected wave from the output side of a transmit signal is equal to or larger than that to electric power application from the input terminal side.

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